

REMARKS

The amendments to the specification correct minor errors and inserts a reference numeral to match the proposed amended Figure 3. No new matter is believed to be added to the application by this Amendment.

Status of the Claims

Claims 1-16 are pending in the application. Claims 1, 3, 5 and 6 are amended to set forth the invention in accordance with the embodiments shown in Figure 3 of the application. Claims 4 and 12 have been amended to improve the language of these claims without reducing their scope. Support for new claims 15 and 16 can be found at page 5 of the specification.

Objection to the Drawings (Paragraph 1 of the Office Action)

The Examiner objects to the drawings as not showing every feature of the invention specified in the claims. The Examiner asserts that the pipe shower must be indicated in the drawings.

The proposed amendments to Figure 3 show a pipe shower 76. The Examiner's attention is drawn to 37 C.F.R. 1.83(a) which states that "Conventional features disclosed in the description and claims, where their detailed illustration is not essential for a proper understanding of the invention, should be illustrated in the

drawing in the form of a graphical drawing symbol or a labeled representation (e.g., a labeled rectangular box)."

That is, the structure of a pipe shower is well known to one having ordinary skill in the art. Thus a person having ordinary skill in the art would be able to practice the invention without having the pipe shower explicitly depicted in the drawings.

Formally amended drawings will be submitted upon indication of allowable subject matter.

Rejection Under 35 U.S.C. 112, Second Paragraph (Paragraphs 2 and 3 of the Office Action)

Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph as omitting essential structural cooperative relationships of elements. Applicant traverses this rejection and respectfully requests reconsideration and withdrawal thereof.

The claims as amended clearly set forth the structural cooperative relationships of elements. As a result, the claims as amended are clear, definite and have full antecedent basis. Accordingly, this rejection is overcome and withdrawal thereof is indicated.

Rejection Under 35 U.S.C. 112, First Paragraph (Paragraphs 4-5 of the Office Action)

Claim 10 is rejected under 35 U.S.C. 112, first paragraph as containing subject matter that was not described in the

specification to practice the invention. Applicant traverses this rejection and respectfully requests reconsideration and withdrawal thereof.

In the Office Action the Examiner states that "the appearance of the pipe shower is not known." However, a pipe shower is conventional technology which would be known to a person having ordinary skill in the art. "The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosure in the patent coupled with information known in the art without undue experimentation." United States v. Teletronics, Inc., 8 USPQ2d 1217 (Fed. Cir. 1988); In re Stephens, 188 USPQ 659 (CCPA 1976).

As a result, claim 10 is fully enabled by the specification. Accordingly, this rejection is overcome and withdrawal thereof is indicated.

Rejection Under 35 U.S.C. 102(b) Over DeOrnellas (Paragraphs 6-7 of the Office Action)

Claims 1, 3-10 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by DeOrnellas (U.S. Patent No. 5,672,239). Applicant traverses this rejection and respectfully requests reconsideration and withdrawal thereof.

The Present Invention and Its Advantages

The present invention pertains to an etch/strip apparatus integrated with cleaning equipment. The etch/strip apparatus contains an etching line for etching and cleaning a substrate. A stripping line for stripping the substrate is connected to the etching line. A cleaning line is installed on the stripping line to clean and dry the substrate. As is set forth in independent claims 1 and 6, as amended, "the etch/strip apparatus is a single piece of equipment." The unitary nature of the apparatus can be discerned from Figure 3 and additionally finds support at page 6, line 2 of the specification.

The etch/strip apparatus can also have an elevator for conveying the substrate from the stripping line to the cleaning line. Additional features can include a transfer for loading the substrate from the etching line to the stripping line, a loader for feeding the substrate to the etching line, and an unloader for receiving the substrate from the cleaning line.

Distinctions of the Invention Over DeOrnellas

DeOrnellas pertains to an integrated semiconductor wafer processing system. Figure 2 of DeOrnellas shows etch modules 20, 22, strip module 24, atmospheric cassette module 34 and rinse module 25, all connected to sides of a hexagonal central vacuum

chamber 26. Wafer cassettes are transferred using a robot arm 38 (see Figure 1).

DeOrnellas fails to disclose an elevator. DeOrnellas also fails to disclose an integrated system that keeps the substrate in one piece of equipment.

That is, the system of DeOrnellas is not integrated, but contains many separate modules in close proximity. The process discussed in column 3 of DeOrnellas requires the central vacuum chamber to be pumped down between each process step. As a result, the modules of DeOrnellas are different from the lines of the invention.

In contrast, the present invention, as is set forth in instantly amended claims 1 and 6, state that the "apparatus is a single piece of equipment." As a result, DeOrnellas fails to disclose the invention as is set forth in independent claims 1 and 6. Claims dependent upon these independent claims are patentable for at least the above reasons alone. Further, the unitary nature of the invention compared to the modular structure of DeOrnellas would fail to motivate a person having ordinary skill in the art to utilize any of the teachings of DeOrnellas to produce a claimed embodiment of the invention. As a result, DeOrnellas cannot be utilized as the basis of a *prima facie* case of obviousness.

Accordingly, this rejection is overcome and withdrawal thereof is indicated.

Rejection Under 35 U.S.C. 103(a) in View of DeOrnellas in View of Toshima (Paragraphs 8 and 9 of the Office Action)

Claims 2 and 11 are rejected under 35 U.S.C. 103(a) as being obvious over DeOrnellas in view of Toshima (U.S. Patent No. 6,007,675). Applicant traverses this rejection and respectfully requests reconsideration and withdrawal thereof.

The Examiner turns to Toshima for teachings pertaining to an elevator. However, Toshima fails to address the deficiencies of the modular technology of DeOrnellas in suggesting a claimed embodiment of the invention.

That is, the system of DeOrnellas uses a central robot arm manipulating cassettes between closely proximate modules. Therefore, there is no geometry in DeOrnellas that can incorporate the elevator of Toshima. As a result, Toshima and DeOrnellas represent two different wafer handling technologies and a person having ordinary skill in the art would have no motivation to combine these references to produce a claimed embodiment of the invention. As a result a *prima facie* case of obviousness has not been made.

Accordingly, this rejection is overcome and withdrawal thereof is indicated.

Prior Art Made of Record and Not Relied Upon by the Examiner

The prior art made of record and not relied upon by the Examiner is indicative of the conventional art which the invention supercedes. Accordingly, no further remarks are necessary.

Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert E. Goozner, Ph.D. (Reg. No. 42,593) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Version with Markings to Show Changes Made

(Rev. 02/20/02)

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please replace the paragraph beginning on page 3, line 13, with the following rewritten paragraph:

--The etch module 42 etches the substrate, using an etchant, to provide a desired pattern on the TFT. The etchant is made from a mixture of MEA (mono ethanol acetone), BDG (butyl-di-glycol) and NMP [(n-methanol-pyrrolidone)] (n-methyl-pyrrolidone).--

Please replace the paragraph beginning on page 7, line 1, with the following rewritten paragraph:

--The substrate cleaned at the rinse module 62 is moved, via the transfer 74, into the strip module 64. The transfer 74 connects the rinse module 62 with the strip module 64 and includes a pipe shower 76 to prevent the substrate from drying. The strip module 64 strips the photoresist on the substrate using a stripper liquid.--

IN THE CLAIMS:

The claims have been amended as follows:

1. (Amended) An etch/strip apparatus integrated with cleaning equipment, comprising:

an etching line for etching and cleaning a substrate;
a stripping line for stripping the substrate, the stripping line being connected to the etching line; and

a cleaning line installed on the stripping line to clean and dry the substrate, wherein the etch/strip apparatus is a single piece of equipment.

3. (Amended) The apparatus as claimed in claim 1, further comprising:

a transfer for moving the substrate from the etching line to the stripping line, the transfer being between the etching line and the stripping line.

4. (Amended) The apparatus as claimed in claim 1, further comprising:

a loader for feeding the substrate to the etching line; and
[a] an unloader for receiving the substrate from the cleaning line.

5. (Amended) The apparatus as claimed in [claim 1,] claim 4, wherein the etching line includes:

an etch module for etching the substrate from the loader;
and

a rinse module for cleaning the substrate fed from the etch module.

6. (Amended) An integrated etch/strip/clean apparatus, comprising:

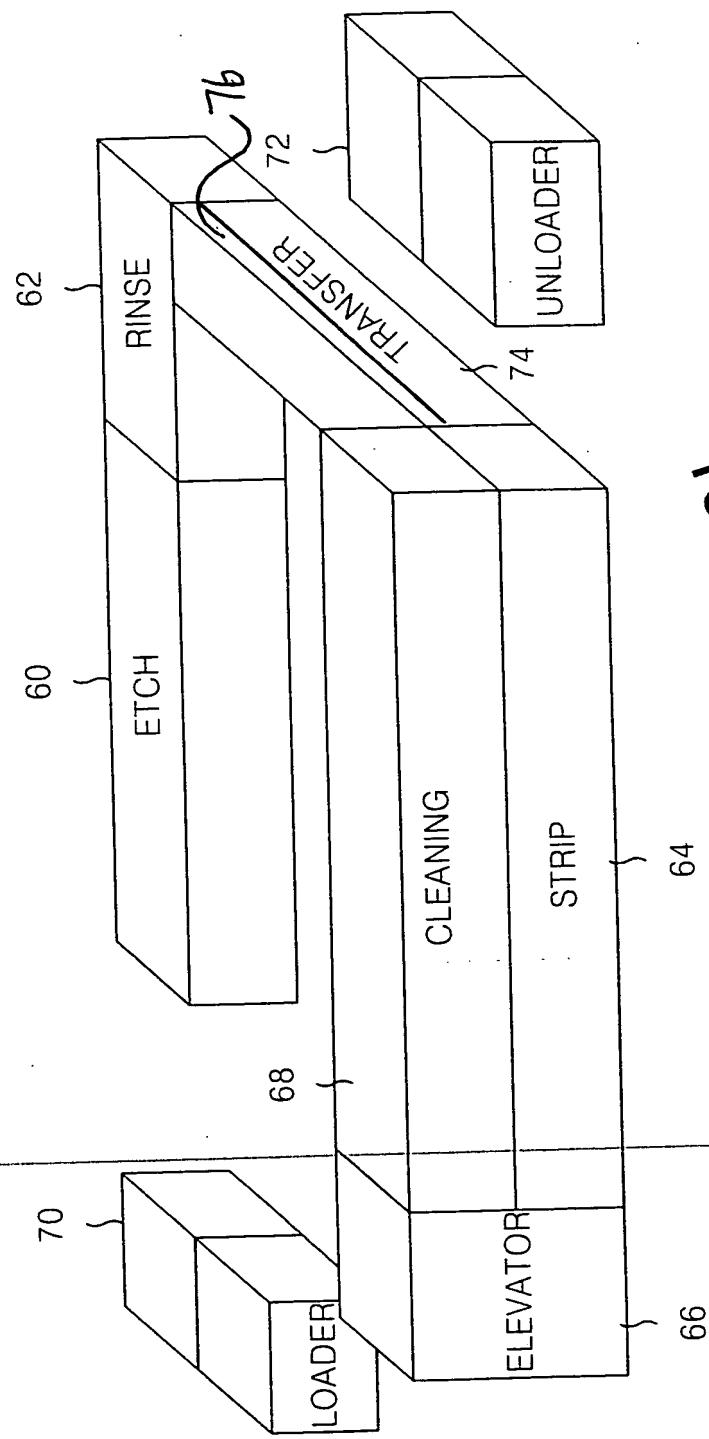
an etching line for etching and cleaning a substrate;
a stripping line for stripping said substrate; and
a cleaning line integrated with said etching and stripping
lines to clean and dry the substrate, wherein the
etch/strip/clean apparatus is a single piece of equipment.

12. (Amended) The apparatus of claim 6, further comprising:

a loader for loading the substrate to the etching line; and
[a] an unloader for unloading the substrate from the cleaning
line.

Claims 15-16 have been added.

FIG. 3



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